

- 1 1. A hydrogen gas generation and collection system comprising:
 - 2 a holding tank providing a reservoir of hydroxide solution;
 - 3 a gas generating tank in fluid flow communication with said reservoir, said generating
 - 4 tank comprising a plurality of metallic fuel rods;
 - 5 means for pressurizing the holding tank;
 - 6 means for transferring hydroxide solution into the gas generating tank from said
 - 7 holding tank in response to pressure to start a gas generating reaction in said generating tank;
 - 8 means for selectively pressurizing said generating tank to return hydroxide solution
 - 9 within the gas generating tank back into said holding tank to stop said reaction;
 - 10 a humidifier tank in fluid flow communication with said generating tank for receiving
 - 11 hydrogen gas from said generating tank and for humidifying it; and,
 - 12 means for delivering humidified hydrogen from said humidifier tank to an application.
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- 14 2. The gas generation and collection system of claim 1 wherein said fuel rods are tubular.
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- 16 3. The gas generation and collection system of claim 2 wherein said fuel rods are
- 17 aluminum.
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- 19 4. The gas generation and collection system of claim 1 wherein the hydroxide solution
- 20 comprises potassium hydroxide.
- 21
- 22 5. The gas generation and collection system of claim 4 wherein the hydroxide solution
- 23 comprises approximately 25% potassium hydroxide by weight.
- 24
- 25 6. The gas generation and collection system of claim 1 wherein said holding tank comprises
- 26 means for heating the hydroxide solution.
- 27
- 28 7. The gas generation and collection system of claim 6 wherein the temperature of the
- 29 holding tank hydroxide solution is approximately 180 degrees Fahrenheit.
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- 31 8. The gas generation and collection system of claim 7 wherein said fuel rods are tubular.

1 9. The gas generation and collection system of claim 8 wherein the hydroxide solution
2 comprises approximately 25% potassium hydroxide by weight.

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4 10. A hydrogen gas generation and collection system comprising:

5 a holding tank providing a reservoir of hydroxide solution, said holding tank
6 comprising means for heating the hydroxide solution;

7 a gas generating tank in fluid flow communication with said reservoir, said generating
8 tank comprising a plurality of internal metallic fuel rods;

9 means for pressurizing the holding tank to transfer hydroxide solution into the gas
10 generating tank from said holding tank thereby generating gas in said generating tank;

11 means for selectively pressurizing said generating tank to return hydroxide solution
12 within the gas generating tank back into said holding tank to stop gas generation;

13 a humidifier tank in fluid flow communication with said generating tank for receiving
14 hydrogen gas from said generating tank and for humidifying it;

15 means for delivering humidified hydrogen gas from said humidifier tank to an
16 application for powering the application, the application producing exhaust;

17 a condenser for receiving said exhaust and producing condensate; and,

18 means for delivering said condensate into said holding tank.
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20 11. The gas generation and collection system of claim 10 wherein the application
21 comprises an engine or fuel cell.
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23 12. The gas generation and collection system of claim 11 wherein said metallic fuel rods are
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25 13. The gas generation and collection system of claim 10 wherein the hydroxide solution
26 comprises approximately 25% potassium hydroxide by weight.
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28 14. The gas generation and collection system of claim 13 wherein the temperature of the
29 holding tank hydroxide solution is approximately 180 degrees Fahrenheit.
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- 1 15. A method for generating hydrogen gas, the method comprising the steps of:
2 providing a reservoir of hydroxide solution;
3 providing a gas generating tank in fluid flow communication with said reservoir;
4 equipping said generating tank with a plurality of tubular, metallic fuel rods;
5 pressurizing the reservoir;
6 transferring hydroxide solution into the gas generating tank from said holding tank in
7 response to pressure to start a gas generating reaction in said generating tank;
8 selectively pressurizing said generating tank to return hydroxide solution within the
9 gas generating tank back into said reservoir to stop said reaction;
10 humidifying hydrogen gas from said generating tank; and,
11 delivering humidified hydrogen gas to an application.
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- 13 16. The method of claim 15 wherein the hydroxide solution providing step uses potassium
14 hydroxide.
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- 16 17. The method of claim 16 wherein the hydroxide solution comprises 25% potassium
17 hydroxide by weight.
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- 19 18. The method of claim 15 including the further step of heating the hydroxide solution
20 within said reservoir.
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- 22 19. The method of claim 18 wherein the heating step raises the temperature of the reservoir
23 hydroxide solution to approximately 180 degrees Fahrenheit.
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- 25 20. The method of claim 19 wherein said fuel rods are aluminum.
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